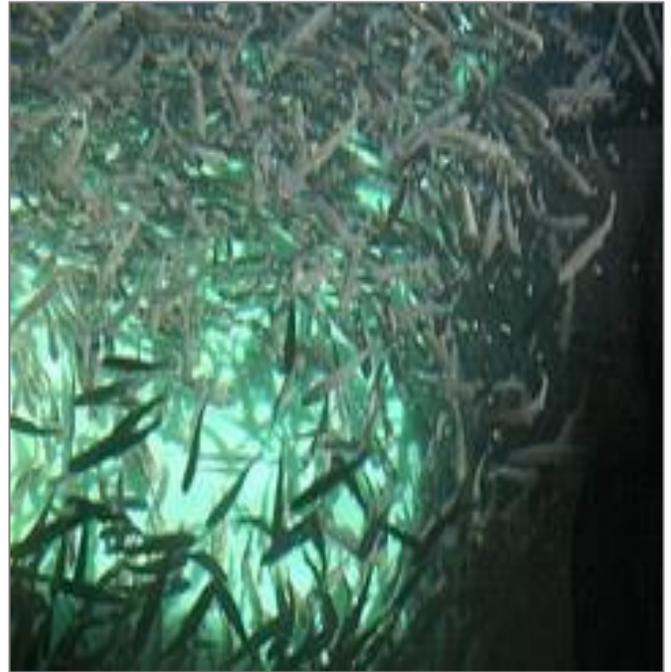


Executive Summary

Final Environmental Impact Statement to Inform Columbia River Basin Hatchery Operations and the Funding of Mitchell Act Hatchery Programs



Introduction

The National Marine Fisheries Service (NMFS) has prepared a final environmental impact statement (EIS) to guide the annual funding of Mitchell Act hatchery programs in the Columbia River Basin.

NMFS began this EIS process in 2004 when it requested scoping help from the public to develop alternatives to evaluate for inclusion in the document. In 2009, NMFS again requested help from the public when it proposed to expand the scope of the EIS to not only evaluate Mitchell Act-funded hatcheries, but all hatcheries within the basin.

In August 2010, NMFS published a draft EIS for public review and comment. In this draft, NMFS evaluated the resource effects of five alternatives (one no action alternative and four action alternatives). NMFS also asked that the public provide NMFS with their ideas for a preferred alternative. The public review of the draft produced over 1,100 comments.

NMFS has been working to incorporate these comments and suggestions, as well as more recent information on the affected resources, into this final EIS. NMFS has formulated and evaluated Alternative 6, the preferred alternative, in this final EIS. This final EIS also provides an updated analysis of the original five alternatives evaluated in the draft EIS.

In addition to identifying the preferred alternative, several other updates and clarifications have been made to the EIS (for a summary of all changes from the draft to the final EIS, see the last section of this Executive Summary). Some of these updates include the following:

- Focusing the scope of the EIS on the purpose of guiding NMFS' decisions on Mitchell Act hatchery program funding

- Updating all baseline data and information in the EIS, including hatchery production, salmon and steelhead harvest, socioeconomic data, and more
- Further clarification of the alternative language, based on public comment

Background

Congress enacted the Mitchell Act (16 United States Code of Federal Regulations [USC] 755 757) in 1938 for the conservation of anadromous (salmon and steelhead) fishery resources in the Columbia River Basin (defined as all tributaries of the Columbia River in the United States [U.S.] and the Snake River Basin). It authorized the establishment, operation, and maintenance of one or more hatchery facilities in the states of Oregon, Washington, and Idaho, scientific investigations to facilitate the conservation of the fishery resource, and “all other activities necessary for the conservation of fish in the Columbia River Basin in accordance with law.” While the Mitchell Act provides the authority for the conservation of fishery resources in the Columbia River, Congress must appropriate funds to implement it.

Since 1946, Congress has continued to appropriate Mitchell Act funds on an annual basis. These funds have been used to support research, improve fish passage, install screens

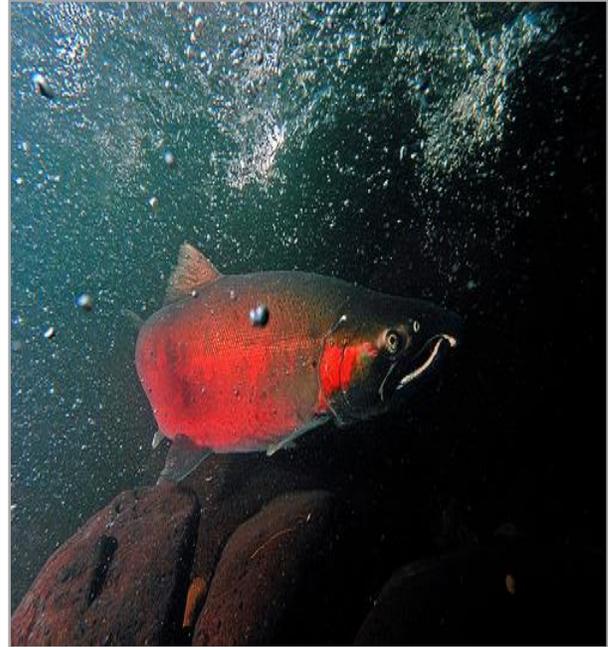
on water diversions, and build and operate more than 20 salmon and steelhead hatchery facilities (referred to in this EIS as Mitchell Act hatchery facilities). Each year, Congress allocates a specific portion of the money appropriated for the Mitchell Act to hatchery operations. For each of the past 10 years (2003 to 2012), Mitchell Act hatchery program funding has been between \$12 and \$22 million dollars. The National Marine Fisheries Service (NMFS), part of the National Oceanic and Atmospheric Administration (NOAA) within the Department of Commerce, currently distributes these appropriations to the operators of 62 hatchery programs that annually produce more than 63 million fish. Historically, Mitchell Act production levels have been as high as 129 million juvenile fish annually, but these levels have been substantially reduced as inflation, budget reductions, maintenance, and other costs have eroded the amount of funding available for fish production.

During the same time that production levels were reduced at hatchery facilities funded under the Mitchell Act, NMFS listed eight evolutionarily significant units (ESUs) of salmon and five distinct population segments (DPSs) of steelhead in the Columbia River Basin under the Endangered Species Act (ESA) (i.e., 13 ESUs/DPSs total). When listing both salmon and steelhead under ESA, NMFS cited the adverse effects of hatchery operations as one of the factors for the decline of most of these listed ESUs/DPSs.

Purpose and Need

The combination of continued funding pressures under the Mitchell Act and the ESA listing of 13 salmon and steelhead ESUs/DPSs in the Columbia River Basin have resulted in the need for NMFS' proposed action. NMFS' purpose for the action is to develop a policy direction to guide its decisions about the distribution of funds for hatchery production under the Mitchell Act.

The review of hatchery programs in this EIS is comprehensive because information on the effects of all Columbia River Basin hatchery programs throughout the basin and across a full range of alternatives is presented in the EIS. Each alternative identifies a different policy direction that would be used to guide NMFS' decisions on Mitchell Act hatchery production.



What is NMFS' Proposed Action?

The proposed action is to develop a NMFS policy direction that will guide NMFS' annual distribution of Mitchell Act hatchery funds.

What is a policy direction?

A policy direction guides and shapes decisions NMFS makes related to Mitchell Act hatchery production in the Columbia River Basin. It is formed by a series of goals and/or principles (Section 2.4.2, Alternative Performance Goals).

What is the relationship between ESA and the National Environmental Policy Act (NEPA)?

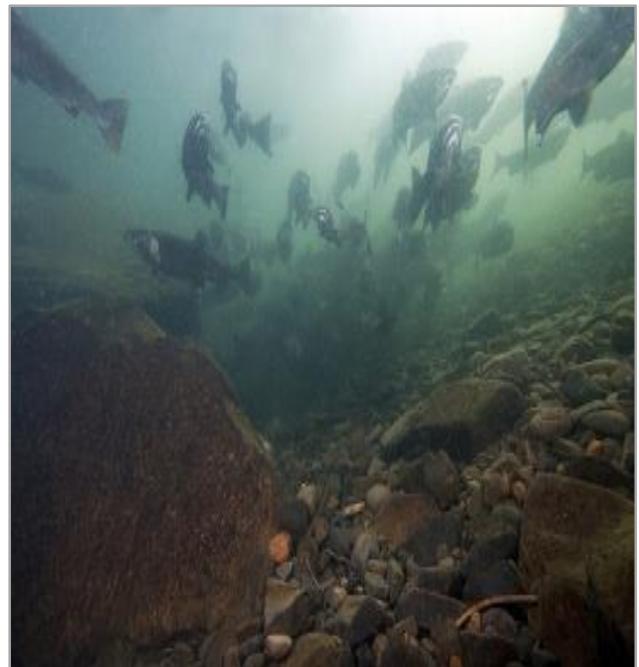
The relationship between the ESA and NEPA is complex, in part because both laws address environmental values related to the impacts of a proposed action. However, each law has a distinct purpose, and the scope and standards of review under each statute are different. This EIS analysis under NEPA should not be viewed as contributing to a conclusion about whether an alternative meets or does not meet ESA requirements.

The purpose of an EIS under NEPA is to promote disclosure, analysis, and consideration of the broad range of environmental issues surrounding a proposed major Federal action by considering a full range of reasonable alternatives, including a no-action alternative. Public involvement promotes this purpose.

ESA's purpose is to conserve listed species and the ecosystems upon which they depend. Determinations about whether Mitchell Act hatchery programs meet ESA requirements will be made independent of this EIS, under ESA section 4(d), section 7, or section 10. Each of these ESA sections has its own substantive requirements, and the documents that reflect the analysis and decisions are different than those related to a NEPA analysis.

It is not the purpose of this EIS to suggest to the reader any conclusions relative to ESA. While the Record of Decision (ROD) identifies the selected NEPA alternative, the ROD does not determine whether that alternative complies with ESA.

NMFS acknowledges that the analyses of environmental effects on listed species under ESA and under NEPA are similar and can lead to confusion; however, the analyses under these separate statutes are not functionally equivalent. Language in this final EIS has been chosen in an effort to minimize the confusion between a NEPA analysis and an ESA analysis. For instance, “jeopardize,” “endanger,” “recover,” and similar terms are commonly used to describe the effect of actions under an ESA analysis. This EIS avoids using these terms, using instead, terms and phrases such as “performance goals” and “performance metrics.”



Project Area

The project area covered in this EIS includes rivers, streams, and hatchery facilities where hatchery-origin salmon and steelhead occur or may occur in the Columbia River Basin, including the Snake River and all other tributaries of the Columbia River in the United States (Figure S-1). The project area also includes the Columbia River estuary and plume. The project area comprises two salmon recovery domains (the Willamette/Lower Columbia and the Interior Columbia) as

established by NMFS under its ESA recovery planning responsibilities. The project area also contains 7 ecological provinces and more than 37 subbasins (i.e., tributaries to the Columbia or Snake Rivers). There are 177 salmon and steelhead hatchery programs in the Columbia River Basin. These hatchery programs originate from more than 80 hatchery facilities, and they produced over 140 million salmon and steelhead in 2010 (Table S-1).

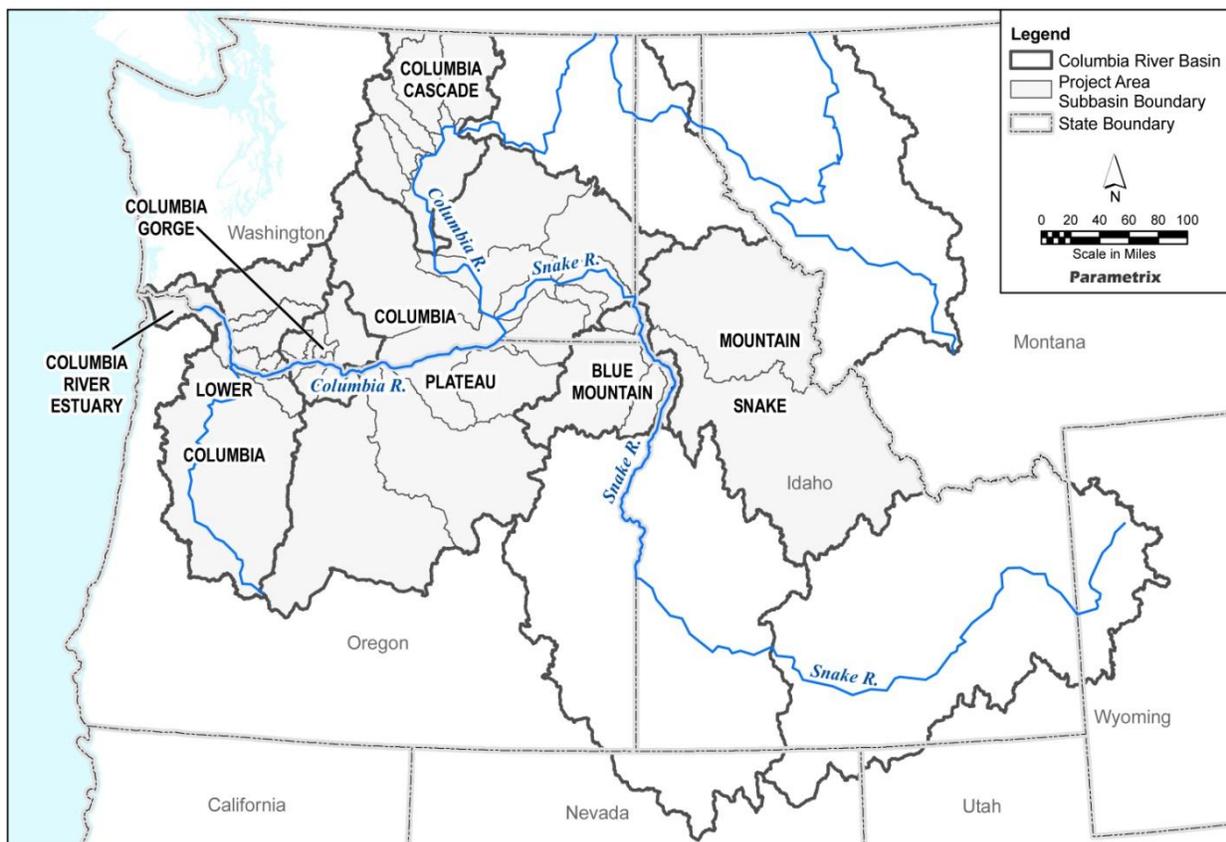


Figure S-1. Project Area by Ecological Province

Table S-1. Total Hatchery-origin Salmon and Steelhead Production within the Columbia River Basin (X 1,000).

Recovery Domain	Fall Chinook Salmon	Spring Chinook Salmon	Summer Chinook Salmon	Coho Salmon	Winter Steelhead	Summer Steelhead	Chum Salmon	Sockeye Salmon	Total
Willamette / Lower Columbia	45,855	13,595	0	15,441	2,011	2,049	250	0	79,201
Interior Columbia	23,129	19,303	3,742	4,299	20	10,537	0	362	61,392
Total	68,984	32,898	3,742	19,740	2,031	12,586	250	362	140,593

Source: Appendix C through Appendix F. Numbers based on production levels in 2010.

Activities that are not considered to be within a reasonable range of potential funding or operational opportunities and that are not, therefore, envisioned within the alternatives in this draft EIS, include the following:

- **Construction of New Hatchery Facilities with Mitchell Act Funds.** Decisions regarding the scope of review in this EIS would not preclude the construction of new or expanded hatchery facilities in the Columbia River Basin. However, current and reasonably foreseeable appropriations under the Mitchell Act for hatchery production would preclude the option to construct new hatchery facilities in the project area (<http://www.whitehouse.gov/omb/budget/Overview>).
- **Fish Screens and Fishways.** The Mitchell Act Screens and Fishways Program is a separate program with separate congressionally appropriated funding.
- **Habitat Restoration.** While Congress clearly has the discretion to direct Mitchell Act funds toward habitat restoration, it has not done so. Congress consistently and specifically has directed funds to hatchery

production (and related monitoring, evaluation, and reform) and to screens and fishways. This EIS is directed at the use of the funds Congress specifically directs towards hatcheries. Through 2014, NMFS has funded habitat restoration through the Pacific Coastal Salmon Recovery Fund, created by Congress in 2000, to address the need to protect, restore, and conserve salmon, steelhead, and their habitat.

- **Hatchery Practices that Increase Adverse Effects.** While not all salmon ESUs or steelhead DPSs in the Columbia River Basin are listed under ESA, there is at least one salmon or steelhead population that is a member of a listed ESU or DPS in each of the major subbasins within the project area. Hatchery practices have been identified as a factor for the decline of most listed salmon and steelhead. Because of these factors, the purpose and need for this action is to establish a policy direction that, among other things, includes information on the effects of alternative hatchery performance goals on natural-origin fish. Implementation of hatchery practices that would likely increase risks to listed species, when compared to existing practices, are not considered in this final EIS.

It is not the purpose of this EIS to determine whether specific actions or hatchery programs meet ESA requirements. These ESA decisions will

be made in separate processes consistent with applicable regulations as required by ESA.



Alternatives Analyzed in Detail

In general, the alternatives analyzed in the EIS are designed to reduce or minimize the adverse effects or increase the benefits of hatchery operations on natural-origin salmon and steelhead populations. Hatchery operators will continue to pursue not only the conservation or harvest goals that currently apply to each hatchery program, but also different or additional conservation

and harvest goals NMFS anticipates that the resource effects analyzed in this EIS will be informative for policy decisions for approximately 10 years.

The alternatives are varying applications of two hatchery performance goals, *intermediate* and *stronger*. These goals are relative to baseline conditions, e.g., *stronger than baseline*.

What are Hatchery Performance Goals?

The EIS uses the terms *stronger performance goal* (i.e., stronger than baseline conditions) and *intermediate performance goal* (i.e., a level between baseline conditions and stronger performance) to indicate different levels of effects reduction or benefits that hatchery programs can have on natural-origin populations of salmon and steelhead. This EIS avoids terms that may be found in an ESA-related analysis, such as *jeopardy*, *recovery*, or similar concepts. These performance goals are not intended to infer compliance with any legal standard, nor are they intended to be analogous to ESA terminology or threshold standards, but they are helpful in aggregating and describing the effect of multiple hatchery programs on natural-origin populations of salmon and steelhead.

Hatcheries operated using stronger performance goals would maintain or promote beneficial effects (benefits) and minimize adverse effects (risks) of hatchery programs on salmon and steelhead populations when compared to baseline conditions.

Hatcheries operated under intermediate performance goals would, in most cases, reduce the adverse effects (risks) of many hatchery programs on salmon and steelhead populations when compared to baseline conditions.

Alternative 1 (No Action)

Under Alternative 1, there would not be a defined policy direction, and Columbia River Basin hatchery production would continue baseline conditions. Based on NMFS' observations, the following describe the baseline conditions:

- Hatchery operators (both Mitchell Act-funded and other) have made substantial improvements to both programs and facilities to reduce the impacts on ESA-listed and non-listed salmon and steelhead populations in the Columbia River Basin.
- Hatchery programs (both Mitchell Act-funded and other) are used primarily to contribute to harvest (Section 2.3.2, Purpose of Hatchery Programs), although some hatchery programs are designed to help conserve natural-origin salmon and steelhead populations.
- Many hatchery programs are used to meet mitigation agreements. Most mitigation occurs to reduce the effects from hydro development on the fisheries resource.
- Monitoring, evaluation, and reform (MER) activities occur, but they are not guided by a comprehensive basinwide plan. MER plans, where they occur, are usually developed at the individual program level.
- Adaptive management of hatchery programs occurs, but it is usually directed at the performance of the program, i.e., survival of juveniles to adult recruits, and it is not necessarily directed at risk reduction on natural populations.

- Best management practices (BMPs) for hatchery facilities are widely applied, but their application is not universal. In many cases, application is based on available funding and/or whether the BMP is a regulatory requirement.
- The amount of Mitchell Act hatchery funding can vary annually (Table 1-3). Hatchery operators generally receive a consistent proportion of the total funding each year.

Alternative 2 (No Mitchell Act Funding)

Under Alternative 2, the policy direction would be defined by the following goals and/or principles:

- All Mitchell Act-funded hatchery programs and facilities would be closed.
- The intermediate performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to the remaining non-Mitchell Act-funded hatchery programs that affect primary and contributing salmon and steelhead populations. Application of the intermediate performance goal would, in most cases, reduce the risks of hatchery programs on natural-origin salmon and steelhead populations.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.
- Production levels would be reduced from levels under Alternative 1 in hatchery programs designed to meet mitigation requirements only when those production levels conflicted with the ability of a hatchery program to meet performance goals.
- Conservation hatchery programs would be operated at a level determined by conservation need. Benefits of the conservation hatchery program must outweigh the risks (Section 3.2.3.1, General Risks and Benefits of Hatchery Programs to Salmon and Steelhead Species).
- Many hatchery programs are used to meet mitigation agreements. These programs would be aligned with the performance goals for the alternative.
- No new hatchery programs would be initiated.
- Monitoring, evaluation, and reform would be guided by a comprehensive basinwide plan.
- Adaptive management planning related to risk reduction would be required for all programs that affect ESA-listed primary and contributing populations.
- BMPs for facilities would be applied to all remaining hatchery facilities.
- Mitchell Act hatchery funding would be eliminated.

Alternative 3 (All Hatchery Programs Meet Intermediate Performance Goal)

Under Alternative 3, the policy direction would be defined by the following goals and/or principles:

- The intermediate performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations. Application of the intermediate performance goal would, in most cases, reduce the risks of hatchery programs on natural-origin salmon and steelhead populations.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.
- Conservation hatchery programs would be operated at a level determined by conservation need. Benefits of the conservation hatchery program must outweigh the risks (Section 3.2.3.1, General Risks and Benefits of Hatchery Programs to Salmon and Steelhead Species).
- Many hatchery programs are used to meet mitigation agreements. These programs would be aligned with the performance goals for the alternative.
- No new hatchery programs would be initiated.
- Monitoring, evaluation, and reform would be guided by a comprehensive basinwide plan.
- Adaptive management planning related to risk reduction would be required for all programs that affect ESA-listed primary and contributing populations.
- BMPs for facilities would be applied to all hatchery facilities.
- Adaptive management planning related to risk reduction would be required for all programs that affect ESA-listed primary and contributing populations.
- Mitchell Act funds would be disbursed in support of the above goals and/or principles.

Alternative 4 (Willamette/Lower Columbia River Hatchery Programs Meet Stronger Performance Goal)

Under Alternative 4, the policy direction would be defined by the following goals and/or principles:

- The intermediate performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations in the Interior Columbia Recovery Domain. Application of the intermediate performance goal would, in most cases, reduce the risks of hatchery programs on natural-origin salmon and steelhead populations.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.

- The stronger performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations in the Willamette/Lower Columbia Recovery Domain. Application of the stronger performance goal would minimize the risks of hatchery programs on natural-origin salmon and steelhead populations more than the intermediate performance goal.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.
- Production levels would be reduced from levels under Alternative 1 in hatchery programs designed to meet mitigation requirements only when those production levels conflicted with the ability of a hatchery program to meet performance goals.
- Conservation hatchery programs would be operated at a level determined by conservation need. Benefits of the conservation hatchery program must outweigh the risks (Section 3.2.3.1, General Risks and Benefits of Hatchery Programs to Salmon and Steelhead Species).
- BMPs for facilities would be applied in all hatchery facilities.
- Many hatchery programs are used to meet mitigation agreements. These programs would be aligned with the performance goals for the alternative.
- New conservation hatchery programs could be initiated in the Willamette/Lower Columbia Recovery Domain for populations deemed at high risk of extinction.
- New harvest hatchery programs could be initiated, and/or existing hatchery programs would be changed to better support harvest opportunities below Bonneville Dam, including ocean fisheries.
- Monitoring, evaluation, and reform would be guided by a comprehensive basinwide plan.
- Adaptive management planning related to risk reduction would be required for all programs that affect primary and contributing salmon and steelhead populations in the Willamette/Lower Columbia Recovery Domain.
- Mitchell Act funds would be disbursed in support of the above goals and/or principles.

Alternative 5 (Interior Columbia River Hatchery Programs Meet Stronger Performance Goal)

Under Alternative 5, the policy direction would be defined by the following goals and/or principles:

- The intermediate performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations in the Willamette/Lower Columbia Recovery Domain. Application of the intermediate performance goals would, in most cases, reduce the risks of hatchery programs on natural-origin salmon and steelhead populations.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.

- The stronger performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations in the Interior Columbia Recovery Domain. These stronger performance goals would minimize the risks of hatchery programs on natural-origin salmon and steelhead populations more than the intermediate performance goal.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.
- Conservation hatchery programs would be operated at a level determined by conservation need. Benefits of the conservation hatchery program must outweigh the risks (Section 3.2.3.1, General Risks and Benefits of Hatchery Programs to Salmon and Steelhead Species).
- Many hatchery programs are used to meet mitigation agreements. These programs would be aligned with the performance goals for the alternative.
- BMPs for facilities would be applied in all hatchery programs.
- New conservation hatchery programs could be initiated in the Interior Columbia Recovery Domain for populations deemed at high risk of extinction.
- New harvest hatchery programs may be initiated, and/or existing hatchery programs would be changed to better support harvest opportunities above Bonneville Dam, including treaty Indian commercial fisheries.
- Monitoring, evaluation, and reform would be guided by a comprehensive basinwide plan.
- Adaptive management planning related to risk reduction would be required for all programs that affect primary and contributing salmon and steelhead populations in the Willamette/Lower Columbia Recovery Domain.
- Mitchell Act funds would be disbursed in support of the above goals and/or principles.

Alternative 6 (Preferred Alternative - All Hatchery Programs Meet Stronger Performance Goal)

Under Alternative 6, the policy direction would be defined by the following goals and/or principles:

- The stronger performance goal (Section 2.4.2.1, Performance Goals Defined) would be applied to all Columbia River Basin hatchery programs that affect primary and contributing salmon and steelhead populations. These stronger performance goals would minimize the risks of hatchery programs on natural-origin salmon and steelhead populations.
 - Integrated hatchery programs would be better integrated than under Alternative 1.
 - Isolated hatchery programs would be better isolated than under Alternative 1.
- Conservation hatchery programs would be operated at a level determined by conservation need. Benefits of conservation hatchery programs must outweigh their risks (Section 3.2.3.1, General Risks and Benefits of Hatchery Programs to Salmon and Steelhead Species).

- Many hatchery programs are used to meet mitigation agreements. These programs would be aligned with the performance goals for the alternative.
- BMPs for facilities would be applied to all hatchery facilities.
- New programs (for conservation, harvest, or both purposes) could be initiated throughout the Columbia River Basin, where appropriate.
- Monitoring, evaluation, and reform would continue to occur. NMFS would continue to work with hatchery operators, basinwide, to develop priorities and strategies for monitoring, evaluation, and reform.
- Adaptive management planning, related to risk reduction, would be required for all programs that affect ESA-listed primary and contributing salmon and steelhead populations in the Columbia River Basin.
- Mitchell Act funds would be disbursed in support of the above goals and/or principles.

Table S-2 summarizes hatchery performance goals for each alternative. Information in the table covers the Willamette/Lower Columbia Recovery Domain and the Interior Columbia Recovery Domain.

Table S-2. Hatchery Performance Goals Identified for Each Alternative’s Policy Direction.

Recovery Domain	Population Type*	-- Hatchery Performance Goals by Alternative --					
		Alternative 1	Alternative 2**	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Preferred Alternative)
Willamette/ Lower Columbia	Primary	Baseline conditions	Intermediate	Intermediate	Stronger	Intermediate	Stronger
	Contributing	Baseline conditions	Intermediate	Intermediate	Stronger	Intermediate	Stronger
	Stabilizing	Baseline conditions	Intermediate	Baseline conditions	Baseline conditions	Baseline conditions	Baseline Conditions
Interior Columbia	Primary	Baseline conditions	Intermediate	Intermediate	Intermediate	Stronger	Stronger
	Contributing	Baseline conditions	Intermediate	Intermediate	Intermediate	Stronger	Stronger
	Stabilizing	Baseline conditions	Intermediate	Baseline conditions	Baseline conditions	Baseline conditions	Baseline Conditions

* Each population’s role in recovery was designated as primary, contributing, or stabilizing. These designations were used by the Lower Columbia River Fish Recovery Board (LCFRB) in the development of the Lower Columbia Fish Recovery Plan (LCFRB 2004). The Hatchery Scientific Review Group (HSRG) adapted these designations throughout the basin after discussions with the hatchery operators, and they are applied in this EIS (Appendix C through Appendix F). Not all recovery plans for salmon and steelhead utilize this same hierarchical structure to identify recovery goals for listed populations.

** Under Alternative 2, Mitchell Act hatchery funding is assumed to be eliminated. The remaining non-Mitchell Act hatchery programs would be managed to meet the intermediate performance goal.

Summary of Resource Effects

The policy directions that are associated with each of the action alternatives (Section 2.5, Alternatives Analyzed in Detail) are goal-oriented and do not identify specific actions that would be taken under each alternative. This is because the National Marine Fisheries Service (NMFS) understands that specific hatchery actions should be determined on a hatchery-program-by-hatchery-program basis. To analyze, illustrate, and compare the potential environmental effects of each alternative, however, an implementation scenario was developed for the policy direction under each alternative. Each implementation scenario is one example of how each hatchery program could be operated to meet the policy direction of the alternative.

Table S-3 summarizes predicted effects from application of implementations scenarios for the No-action Alternative (Alternative 1) and action alternatives (Alternative 2 through Alternative 6). The summary reflects the detailed resource discussions in Chapter 4, Environmental Consequences.

Table S-3. Summary of Environmental Consequences for Each Alternative's Implementation Scenario by Resource.

Resource	Indicator	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Preferred Alternative)
Fish	VSP Indicator¹: Increase in estimated natural-origin spawner abundance (all ESUs/DPSs)	342,772 (baseline total estimated abundance)	Increase of 15% compared to Alternative 1	Increase of 11% compared to Alternative 1	Increase of 11% compared to Alternative 1	Increase of 10% compared to Alternative 1	Increase of 7% compared to Alternative 1
	VSP Indicator¹: Increase in ESU/DPS estimated mean adjusted productivity	Estimated baseline productivity for the 17 existing ESUs/DPSs	15 of the 17 ESUs/DPSs with increased productivity compared to Alternative 1	15 of the 17 ESUs/DPSs with increased productivity compared to Alternative 1	15 of the 17 ESUs/DPSs with increased productivity compared to Alternative 1	15 of the 17 ESUs/DPSs with increased productivity compared to Alternative 1	11 of the 17 ESUs/DPSs with increased productivity compared to Alternative 1
	VSP Indicator¹: Estimated increase of primary ² and contributing ² salmon and steelhead populations with stronger performance for genetic diversity	Estimated baseline number of populations meeting stronger performance	Increase of 48% compared to Alternative 1	Increase of 26% compared to Alternative 1	Increase of 35% compared to Alternative 1	Increase of 37% compared to Alternative 1	Increase of 13% compared to Alternative 1

Table S-3. Summary of Environmental Consequences for Each Alternative's Implementation Scenario by Resource (continued).

Resource	Indicator	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Preferred Alternative)
Socio-economics	Commercial gross ex-vessel value (2009 U.S. dollars [\$]) in the Columbia River Basin	\$5,591,040 ex-vessel value	Ex-vessel value reduction of 51% compared to Alternative 1	Ex-vessel value reduction of 12% compared to Alternative 1	Ex-vessel value reduction of 5% compared to Alternative 1	Ex-vessel value reduction of 3% compared to Alternative 1	Ex-vessel value increase of 14% compared to Alternative 1 ³
	Total (direct and secondary) economic benefit to income (2009 U.S. dollars [\$]) in the Columbia River Basin	\$173,564,549 total personal income	Reduction in total income benefit of 33% compared to Alternative 1	Reduction in total income benefit of 7% compared to Alternative 1	Reduction in total income benefit of 4% compared to Alternative 1	Same as Alternative 1	Increase in total income benefit of 8% compared to Alternative 1
	Total (direct and secondary) economic impacts on jobs in the Columbia River Basin	4,503 jobs	32% reduction in jobs compared to Alternative 1	8% reduction in jobs compared to Alternative 1	5% reduction in jobs compared to Alternative 1	Less than 1% reduction in jobs compared to Alternative 1	7% increase in jobs compared to Alternative 1
	Recreational expenditures (2009 U.S. dollars [\$]) in the Columbia River Basin	\$125,136,636 in recreational expenditures	31% reduction in recreational expenditures compared to Alternative 1	10% reduction in recreational expenditures compared to Alternative 1	8% reduction in recreational expenditures compared to Alternative 1	3% reduction in recreational expenditures compared to Alternative 1	3% increase in recreational expenditures compared to Alternative 1
Environmental Justice	Total tribal fish harvests (commercial, ceremonial, and subsistence) by number of fish in the Columbia River Basin	216,800 fish harvested	42% reduction in fish harvests compared to Alternative 1	11% reduction in fish harvests compared to Alternative 1	10% reduction in fish harvests compared to Alternative 1	5% reduction in fish harvests compared to Alternative 1	3% increase in fish harvests compared to Alternative 1 ⁴
	Tribal fishing revenue in the Columbia River Basin (2009 U.S. dollars [\$])	\$2,952,345 tribal fishing revenue	44% decrease in tribal fishing revenue compared to Alternative 1	10% decrease in tribal fishing revenue compared to Alternative 1	9% decrease in tribal fishing revenue compared to Alternative 1	6% increase in tribal fishing revenue compared to Alternative 1	18% increase in tribal fishing revenue compared to Alternative 1 ³
Wildlife	Caspian terns and bald eagles	Populations likely to increase	Potential reductions in abundance, distribution, and fitness relative to Alternative 1	Same as Alternative 2	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1

Table S-3. Summary of Environmental Consequences for Each Alternative's Implementation Scenario by Resource (continued).

Resource	Indicator	Alternative 1 (No Action)	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Preferred Alternative)
Wildlife (continued)	Southern Resident killer whale (listed)	80 individuals are currently in Southern Resident stock; populations would continue to fluctuate	Potential reductions in abundance relative to Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
	California sea lions	Populations likely increasing	Abundance in Columbia River would probably decline relative to Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
	Steller sea lions (Eastern)	Populations likely increasing	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Water Quality and Quantity	NPDES permit compliance and water use	NPDES permits and changes in water quality	Continued compliance with NPDES permits	Continued compliance, potential improvements in water quality, and reduction in water use	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2
Human Health	Hatchery chemical safety and use	Continued chemical and antibiotic use consistent with Federal and state guidelines; potential pathogen exposure	Potential decrease in use of chemicals and antibiotics; no change in exposure to pathogens	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

¹ Viable Salmonid Population (VSP), based on McElhany (2000), is a conceptual framework for evaluation of the viability of salmonid populations based on four measurable indicators of population health: abundance, productivity, diversity, and spatial structure (See Section 3.2.3.1.1, Effects on the Viable Salmonid Population Concept). The EIS only summarizes effects on abundance, productivity, and diversity here. See Section 4.2.2.1, Methods for Determining Effects on VSP for Salmon and Steelhead, for more information.

² "Primary" and "contributing" populations are terms that were used by LCFRB in the development of the Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan (LCFRB 2004), adapted throughout the basin by HSRG (2009) after discussions with the Columbia River fish managers. They are applied in this final EIS (Section 2.4, Alternative Development). Not all recovery plans for salmon and steelhead utilize this same hierarchical structure to identifying recovery goals for listed populations.

³ Changes in commercial gross ex-vessel value result from a combination of modifications in the total number of fish harvested and variations in the composition of the fish harvest, based on alterations in the hatchery production in the alternative implementation scenario.

⁴ Increase in total tribal fish harvested results from changes to hatchery program production numbers and the composition of the species and run-type released, i.e., a higher proportion of upriver bright (URB) Chinook salmon than tule Chinook salmon. These changes can result in more of these fish available for harvest under the EIS harvest rate assumptions.

SUMMARY OF CHANGES FROM DRAFT EIS TO FINAL EIS

This final EIS incorporates many updates to the information presented in the draft EIS, as well as revisions to the document based on comments submitted during the public review period and the inclusion of an additional alternative, Alternative 6, the preferred alternative. Below is a summary of changes made to the document.

General Changes that Apply to all Final EIS Chapters

- 1) **Terminology.** The terminology used in the final EIS is updated for consistency throughout the document (e.g., isolated hatcheries replace segregated hatcheries). Changes in terminology used for the final EIS are described in the Glossary of Key Terms.
- 2) **Alternative 6.** A new alternative (Alternative 6) is added to the final EIS, which is described in Chapter 2, Alternatives, and analyzed for all resources in Chapter 4, Environmental Effects. Alternative 6 is developed based on NMFS' response to public comments, and it includes goals and principles that also occur in the other four action alternatives.
- 3) **Hatchery Production Levels.** The final EIS is updated to reflect hatchery production levels from 2010 (The draft EIS used 2007 production levels). These production levels are shown in Chapter 2, Alternatives; in alternative comparison tables in Chapter 4, Environmental Effects; and in the species-specific appendices (Appendix C through Appendix F).
- 4) **Response to draft EIS Comments.** Additional information and/or corrections are made in this final EIS to respond to draft EIS public comments. Comments and NMFS' responses to comments are provided in a new appendix (Appendix L).
- 5) **Information Sources and Uniform Reference Locators (URLs).** Where references that are more current are available, rather than those used in the draft EIS, the current references are used for the final EIS. The URLs for references in the EIS are also updated as needed. URLs are the global addresses of documents and other resources on the World Wide Web.
- 6) **Grammatical, Numerical, and Editing Changes.** Grammatical, numerical, and editing errors are corrected where observed.
- 7) **Change from draft EIS to final EIS.** Where applicable, language pertinent to the draft EIS is revised to represent the final EIS.
- 8) **Table Numbers.** New tables are added to the final EIS. This results in an update to many of the table numbers from that shown in the draft EIS.

Chapter 1

- 1) **New Information.** Additional historical and background information regarding the Mitchell Act and associated funding is added or updated in the final EIS to improve project understanding. Additional detailed information is provided on Mitchell Act hatchery programs.
- 2) **Table Revisions.** Draft EIS tables are updated to reflect the updated baseline information and other additional current information.
- 3) **Purpose and Need.** The purpose and need for the EIS are updated to better reflect how NMFS will use the information analyzed and reviewed herein for future decision-making related to Mitchell Act hatchery funding.
- 4) **Mitchell Act Hatchery Production.** The Mitchell Act Artificial Production Program description is revised to provide a clearer understanding of the program applications.
- 5) **Relationship of the EIS to ESA.** Chapter 1 provides further clarification of how NEPA and the analysis in the final EIS relates to ESA and future actions NMFS may take relative to proposed hatchery actions under ESA sections 10, 7, and 4(d).
- 6) **Non-Mitchell Act-funded Programs.** Further clarification is provided describing the relationship between NMFS and non-Mitchell Act hatchery operators.
- 7) **Updates on Hatchery Programs.** The hatchery programs and primary hatchery facilities are updated to include the primary facility, program name, program purpose, and funding source.
- 8) **Draft EIS Public Comment Period.** The date of the draft EIS publication and associated public comment period is added to Chapter 1.
- 9) **Applicable Plans, Policies, Regulations, Agreements, Laws, and Executive Orders.** This section is revised, based on public comment, to update existing information and include additional background information where needed. Additional applicable plans, policies, regulations, agreements, laws and policies added to this section are as follows:
 - Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments)
 - Columbia Basin Fish Accords
 - Lower Snake River Compensation Plan
 - John Day Mitigation
 - Salmon and Steelhead Recovery Plan

The Washington State's Wildlife Salmonid Policy section (draft EIS) is updated and revised to reflect the current policy entitled "Washington State's Hatchery and Fishery Reform Policy."

Chapter 2

- 1) **Columbia River Hatchery Programs.** Information on the hatchery programs evaluated in this EIS has been updated and corrected (e.g., number and relative location of hatchery and operational strategies are provided).
- 2) **Other Factors Affecting Salmon and Steelhead Populations. Harvest, Habitat, and Hydro—the other H's.** Other factors that affect listed salmon in addition to hatchery programs are summarized, along with NMFS' actions to address these factors.
- 3) **Hatchery Operations.** Additional information is added to the final EIS in recognition that flexibility in NMFS policy is needed for hatchery program operations due to long-term hatchery investments of time, effort, and resources, as well as the site-specific conditions that each hatchery program operates in.
- 4) **Geographic Scope.** Additional text is provided describing the need for a broad geographic scope of analysis to fully inform NMFS for future hatchery funding actions.
- 5) **Performance Goals.** The reasoning guiding the need for performance goals for all hatcheries in the Columbia River Basin is provided, along with further clarification and description of the different performance goals (i.e., stronger and intermediate performance goals). The definitions for stronger and intermediate metrics are revised, based on public comment, compared to the definitions presented in the draft EIS.
- 6) **All Alternatives.** Chapter 2, Alternatives, contains detailed information that describes each of the alternatives analyzed in detail.
- 7) **New Alternative.** A new alternative (Alternative 6) is added to this chapter. Performance goals are provided for this alternative, along with a detailed description of the associated goals and principles.
- 8) **Preferred Alternative.** The preferred alternative is identified and described. The draft EIS did not propose a preferred alternative for consideration. Instead, the draft EIS stated that NMFS "will formulate and identify a preferred policy direction [alternative], informed by public comment on the draft EIS, in the final EIS. The preferred policy direction could be one of the alternative policy directions considered in the draft EIS, or it could consist of a combination or blend of the alternative policy direction evaluated in the draft EIS."

- 9) **Alternatives Not Analyzed in Detail.** Three additional alternatives that are not further evaluated in the EIS are described. Where needed, further description of other alternatives not analyzed in detail is provided.

Resource Analyses in Chapter 3 and Chapter 4

Chapter 4 Introduction

- 1) **Implementation Scenarios.** The alternative implementation scenarios provided in Chapter 2 of the draft EIS are moved to this section. New text added, informed by public comment, explains that the implementation scenarios are intended to represent generalized examples of how each alternative's policy goal could be implemented. This section further clarifies that the programs developed under each alternative's implementation scenarios should not be viewed as necessarily consistent with application of ESA since ESA determinations are made during program-specific consultations, which are external to the NEPA process. The implementation scenario for Alternative 6 is also added to this section.
- 2) **Implementation Measures.** Further clarification is provided stating that NMFS applies these measures within the implementation scenarios to illustrate and disclose the potential effects of applying each alternative's policy direction.
- 3) **Performance Metrics.** Performance metrics used in the implementation scenarios are further described in this section. The difference between a hatchery performance goal and a performance metric is also described.
- 4) **Hatchery Practices.** Updates include recognition that hatchery operators use unique approaches to maximize benefits and minimize risks to natural-origin fish.
- 5) **All-H Analyzer.** More information is provided about the model, reasons for using it for the EIS analysis, and how readers should consider the information produced from the model.
- 6) **Watersheds and Hatchery Programs.** The table showing Columbia River subbasins or major watersheds where hatchery fish are assumed to not be released, based on each alternative's implementation scenario is revised to reflect the watersheds associated with hatchery programs within each alternative.
- 7) **New Weirs.** The number of new weirs associated with each alternative implementation scenario is updated for Alternative 3, Alternative 4, and Alternative 5 based on the updated baseline information. Box 4-3 on weirs is corrected to reflect that a permanent weir would be operated with a trapping efficiency needed to achieve the necessary performance goal, but not greater than 95 percent effective.

- 8) **Populations meeting Performance Metrics.** The number of populations that would meet performance metrics is revised for each alternative to reflect the hatchery programs that are analyzed for each alternative.
- 9) **Terminated Hatchery Programs.** Hatchery programs assumed to be terminated under the Alternative 6 implementation scenario are added to this section, as well as updated lists of programs assumed to be terminated under Alternative 2 through Alternative 5.
- 10) **New Hatchery Programs.** The new hatchery programs assumed to be initiated under one or more alternative implementation scenarios are updated for this section.

Fish

Chapter 3

- 1) **Implementation Scenarios.** Additional information is added, based on public comments, explaining the need for implementation scenarios in order to inform and disclose the potential effects of the action alternatives.
- 2) **VSP.** The use and value of the VSP concept (see Notes, Table S-3) are described as indicators of salmon population health. The VSP parameter includes abundance, productivity, diversity, and spatial structure. Each of these indicators is described in this section. Additional references are provided as appropriate.
- 3) **Risks from Disease Transfer.** Recent information on disease outbreaks that have occurred in coastal Washington steelhead hatcheries is provided.
- 4) **Listed Fish Species.** The Federal and state listing status for fish reviewed in this section is updated.
- 5) **Lower Columbia River Chinook Salmon ESU.** The current status and trends for this species are updated.
- 6) **Mid-Columbia River Spring-run Chinook Salmon ESU.** Added to this section is the effort to reintroduce spring-run Chinook salmon into the Walla Walla and Umatilla Basins.
- 7) **Upper Columbia River Spring-run Chinook Salmon ESU.** The current status and trends for this species are updated.
- 8) **Upper Willamette River Chinook Salmon ESU.** The current status and trends for this species are updated.
- 9) **Snake River Spring/Summer-run Chinook Salmon ESU.** More information is provided on the populations at risk.

- 10) **Snake River Fall-run Chinook Salmon ESU.** The current status and trends for this species are updated.
- 11) **Lower Columbia River Steelhead DPS.** The current status and trends for this species are updated.
- 12) **Middle Columbia River Steelhead DPS.** Additional information on the effects of the Pelton Round Butte hydro-complex on this species is added.
- 13) **Snake River Basin Steelhead DPS.** The current status and trends for this species are updated.
- 14) **Upper Columbia River Steelhead DPS.** Information on historical releases of hatchery-origin steelhead is revised, along with updates to the current status and trends for this species.
- 15) **Columbia River Cum Salmon ESU.** The current status and trends for this species are updated.
- 16) **Snake River Sockeye Salmon ESU.** The current status and trends for this species are updated.
- 17) **Other Fish Species.** More description is provided that describes the other fish species selected for review in the EIS.
- 18) **Eulachon.** NMFS' designation of critical habitat for this species is added to this section.
- 19) **Green Sturgeon.** Additional information on fisheries bycatch of green sturgeon is added to this section.
- 20) **Nonindigenous Fish Species.** This is a new section added to the final EIS.

Chapter 4

- 1) **All-H Analyzer.** Information is provided about the model, reasons for using it for the EIS analysis, and how readers should consider the information produced from the model.
- 2) **BMPs for Hatchery Facility Effects.** The reader is referred to tables where the BMPs are located in the final EIS.
- 3) **Genetic Diversity.** The methods used to describe genetic diversity are provided.
- 4) **Effects on VSP Parameters.** Additional information is provided for the salmon and steelhead abundance and productivity VSP parameters.

- 5) **Populations Meeting Performance Metrics.** All tables describing the number of populations that meet stronger, intermediate, and/or weaker performance goals by alternative are revised based on the hatchery programs evaluated by alternative and modified definitions in the final EIS for stronger and intermediate performance metrics. The text associated with these tables is modified to reflect the table changes.
- 6) **New Weirs.** The number of new weirs associated with each alternative is revised, along with weir effectiveness estimates for achieving performance metrics.
- 7) **Other Fish Species.** A description of how the alternative analysis is conducted for other fish species is provided.
- 8) **Eulachon.** Additional information is provided on this species' known distribution.
- 9) **Nonindigenous Fish Species.** An environmental effects analysis is provided for nonindigenous fish species that are added to Chapter 3 of the final EIS.
- 10) **Alternative 6.** Effects on fisheries from the implementation scenario under Alternative 6 are described.
- 11) **Hatchery Production.** All tables and text that rely on hatchery production numbers are revised based on updated hatchery production numbers developed for this final EIS.

Socioeconomics

Chapter 3

- 1) **Hatchery Production.** All tables and text that rely on hatchery production numbers, costs, and revenues are revised based on updated hatchery production numbers developed for this final EIS and updated costs.
- 2) **Historical Overview.** The source of background information for the final EIS is added to this section, which includes comments received during review of the draft EIS.
- 3) **Commercial Harvest and Economic Value.** Additional information on the location of commercial fisheries for tribes and other users is provided. The catch of salmon and steelhead is further described to better understand differences in catch by species.

Chapter 4

- 1) **Hatchery Smolt Production by Funding Source.** This section states that assignment of hatchery smolt production to either Mitchell Act-funded hatchery programs or to other hatchery program funding is estimated for alternative comparison purposes only.
- 2) **Alternative Comparisons.** Although the text for this section has numerous changes, they are primarily from quantitative catch and monetary variations based on modifications in hatchery production, more recent available data, and updated costs.

- 3) **Alternative 6.** Effects on socioeconomic conditions from the implementation scenario under Alternative 6 are described.

Environmental Justice

Chapter 3

- 1) **Fishing Communities.** Additional reference information is provided on how communities are selected for analysis as environmental justice communities.
- 2) **Demographic Data.** References are updated for methods used to determine recreational anglers, environmental justice thresholds, and minority and low-income groups. Based on these updated references, which include data from the 2010 census, the table that identifies environmental justice communities of concern is revised.
- 3) **Nez Perce Tribe.** Updated and corrected information, based on public comment, is provided for this tribe.
- 4) **Coastal Tribes.** Information is provided on fishing use of the project area by coastal tribes, including their fishing rights.
- 5) **Importance of Salmon to Tribes.** Additional information is provided in this section that describes the importance of salmon to tribes, as well as how tribes historically and currently use and value salmon within their culture.
- 6) **Ceremonial and Subsistence Harvests.** Additional information is provided that describes how tribes use salmon for ceremonial use and subsistence. Additionally, the extent of information available quantifying both the tribes' use by salmon species and the relative locations where tribes catch these fish on the Columbia and Snake Rivers is provided.
- 7) **Tribal Revenues and Hatchery Production.** Tribal revenues and hatchery production by tribes are updated based on most recent available information.
- 8) **Descriptions of Environmental Justice Groups.** The text for each of the user groups and communities of concern is updated to reflect information obtained from the 2010 census.
- 9) **Public Outreach.** This section is updated from the draft EIS.

Chapter 4

- 1) **Hatchery Production.** All tables and text that rely on hatchery production numbers, costs, and revenues are revised based on corrected hatchery production numbers and updated costs.

- 2) **Fish Harvests and Tribal Values.** Methods to determine tribal fish harvest are further described. Information is provided stating that the economic effects described in this section do not account for the additional social and cultural effects on the tribal way of life and culture.
- 3) **Ceremonial and Subsistence Harvests.** The additional ceremonial and subsistence harvest information provided in Chapter 3 for environmental justice is further evaluated by alternative in this revised section.
- 4) **Tribal Salmon Fishing and Hatchery Program Revenue.** Additional information recognizes that spending on tribal hatchery programs provides an indirect source of income to tribal communities where hatcheries are located.
- 5) **Non-tribal Users of Concern.** Information is provided describing that the EIS analysis for environmental justice focuses primarily on those communities and tribal fishing areas at and north of Astoria, Oregon.
- 6) **Alternative 6.** Effects on environmental justice user groups and communities of concern from the implementation scenario under Alternative 6 are described.

Wildlife

Chapter 3

- 1) **Listed Wildlife Species.** The Federal and state listing status for wildlife is updated as needed.
- 2) **Southern Resident Killer Whale.** This section is revised to further describe the location and use of the project area by Southern Resident killer whales, as well as their most recent documented diet on a seasonal basis.
- 3) **Steller Sea Lion.** Updates to this section are based on most recent published information regarding Steller sea lion, including the ESA listing status, use of the project area, and its diet.
- 4) **Gulls, Terns, Cormorants, and Pelicans.** Additional information on gulls, terns, cormorants, and pelicans as predators of salmon and their use of the project area is provided.
- 5) **Hatchery Predator Control Programs and Weirs.** This section is revised to provide updated information on how hatchery predator control programs and weirs affect wildlife.
- 6) **California Sea Lion.** Updated information on the presence of California sea lions in the Columbia River and their consumption of salmon, particularly at Columbia River dams, is provided.

- 7) **Effects of Hatchery Facilities on Wildlife.** More detailed information is provided on the direct and indirect effects of hatchery facilities on wildlife.
- 8) **Salmon Carcass Benefits.** More detailed information is provided on the value of salmon carcasses for wildlife.

Chapter 4

- 1) **Salmon and Steelhead Abundance.** Estimated adult and smolt salmon and steelhead abundance is revised for each action alternative based on revised hatchery production numbers. This revision affects those wildlife species that prey on salmon. As a result, the description of the effects of implementation scenarios from the various alternatives for all wildlife species is revised based on the importance of salmon and steelhead in the diet of wildlife for each of the species and wildlife groups reviewed.
- 2) **Effects of Salmon Carcasses to Wildlife.** This section is revised for consistency with revised Section 3.5.6.5, Nutrients/Distribution of Salmon Carcasses.
- 3) **Southern Resident Killer Whale.** Based on the updated Southern Resident killer whale information provided under Section 3.5.3, ESA-listed Species, and revised hatchery production numbers, the effects of the alternatives on this species are revised.
- 4) **Steller Sea Lion.** Based on the updated Steller sea lion description provided under Section 3.5.5, Marine Mammals, and the revised hatchery production numbers, the effects of the alternatives on this species are revised.
- 5) **All Wildlife Species.** Further clarification is provided for all wildlife that may feed on salmon and steelhead as part of their varied and diverse diet, recognizing that effects on wildlife from changes in hatchery production under several alternatives may be difficult to differentiate from other sources of natural variability in their prey base.
- 6) **California Sea Lion.** Based on the updated California sea lion information under Section 3.5.5, Marine Mammals, and the revised hatchery production numbers, the effects of the alternatives on this species are revised.
- 7) **Alternative 6.** Effects on wildlife species from the implementation scenario under Alternative 6 are described.

Water Quality

Chapter 3

- 1) **Federal Regulations Applicable to Water Quality at Hatcheries.** Further clarification, based on public comment, is provided regarding the Federal regulatory requirements and permits necessary for hatchery facilities.

- 2) **State Water Quality Compliance for Hatcheries.** Water quality regulatory compliance requirements for hatcheries in Washington and Idaho are revised and updated as needed.
- 3) **Hatcheries and Pollutants.** The table identifying pollutants potentially associated with hatchery facilities is updated.

Chapter 4

- 1) **All Alternatives.** This section is updated, based on public comment, to recognize that reductions in pollutant discharge levels would likely occur over time under all alternatives, including the no-action alternative, when hatcheries are required to meet new or renewed National Pollutant Discharge Elimination System (NPDES) permits or total maximum daily load (TMDL) regulations.
- 2) **Periodic Effluent Exceedances.** Revisions to the text, based on public comment, indicate that periodic effluent water quality permit exceedances may occur on a temporary basis, but would continue to be reported to the appropriate permitting agency.
- 3) **Permit Status.** Based on public comment, revised language recognizes that some permits (i.e., NPDES permits) still in effect may not reflect current water quality conditions and available technologies, since these conditions change over time.
- 4) **Alternative 6.** Effects on water quality from the implementation scenario under Alternative 6 are described.

Human Health

Chapter 3

- 1) **Chemical Properties.** Based on updated information, the table describing properties of chemicals commonly used at hatchery facilities is updated.
- 2) **Contaminated Fish Feed.** Updated information regarding research on contaminated fish feed at U.S. Fish and Wildlife Service fish hatcheries is provided.
- 3) **NPDES Reporting Requirements.** Information is provided on NPDES requirements that hatcheries report whether painted and caulked surfaces may come into contact with process water.

Chapter 4

- 1) **All Alternatives.** This section is updated to note that reductions in pollutant discharge levels would likely occur under all alternatives, including the no-action alternative, when hatcheries are required to meet new or renewed NPDES permits or TMDLs.
- 2) **Alternative 6.** Effects on human health from the implementation scenario under Alternative 6 are described.

Chapter 5

- 1) **Projects Identified as Potential Future Actions.** Each of these projects identified in the draft EIS is revised based on current known information.
- 2) **Tribal Fish Harvest and Tribal Hatchery Revenue.** This section is revised to recognize the potential for cumulative adverse tribal effects from climate change and future development.

Other EIS Chapters and Sections

- 1) **Glossary.** The glossary is updated to define new terms.
- 2) **Chapter 7, Distribution List.** This list is updated to reflect the mailing list for the final EIS.
- 3) **Chapter 8, List of Preparers.** This list is updated to reflect additional NMFS staff and contracted employees who helped prepare the final EIS.
- 4) **Chapter 9, Index.** An index is added to the final EIS.

Appendices

Appendix A, Hatchery Programs and Facility Information, is updated to reflect 2010 baseline hatchery production and natural-origin population effects.

Appendix C through Appendix F, Species-specific Tables. All tables are updated to reflect 2010 baseline conditions, reapplication of draft EIS alternatives, and the addition of Alternative 6, the preferred alternative.

Appendix G, Overview of the All-H Analyzer, is updated based on comments on the draft EIS.

Draft EIS Appendix I, Socioeconomics Report by the Research Group. This appendix is removed from the final EIS and is used as a reference where needed.

Final EIS Appendix I, The Recovery Implementation Science Team, Hatchery Reform Science, 2009, is added, based on public comment, to give context to some of the methods and principles associated with application of the implementation measures, metrics, and models used in the EIS, relative to hatchery program operations.

Appendix J, Socioeconomic Impact Methods, is updated to reflect recent information available since the draft EIS was published and to incorporate information received during the public review period.

Appendix K, Chinook and Coho Salmon Fishery Modeling Approach for Application to the Mitchell Act FEIS, is updated to incorporate recent relevant changes in fisheries structure, based on comments received during the public review, as well as updates on managed fisheries in the Columbia River; marine areas of Washington, Oregon, and California; and marine fisheries in British Columbia, Canada, and Southeast Alaska.

Draft EIS Appendix L, Supporting Demographic and Socioeconomic Data for the Analysis of Environmental Justice Impacts, is removed from the final EIS. Relevant data from this appendix is updated and incorporated into the final EIS.

Final EIS Appendix L, Responses to Public Comments, is added to the final EIS. This appendix consists of public comments on the EIS and NMFS' responses to these comments.

